CLAIMS

1. Apparatus for delivering radiation beneath a tissue surface, comprising:

a radiation source for inputting a beam of said radiation of predetermined energy fluence; and

a beam converter having a symmetry axis, said beam converter adapted to direct said input radiation in a plurality of directions spaced around said symmetry axis and inclined angularly to said symmetry axis, towards at least one target volume disposed on said symmetry axis beneath said surface, wherein

said radiation has an energy fluence at said surface which is lower on said axis than the maximum energy fluence of said radiation on said surface,

said energy fluence of said radiation at said surface is lower than said predetermined energy fluence of said input beam, and

said energy fluence of said radiation at said at least one target volume is higher than said energy fluence of said radiation at said surface.

2. The apparatus according to claim 1, wherein said beam converter comprises a rotator having a rotation axis collinear with said symmetry axis for rotating said input radiation around said symmetry axis, such that said radiation is spread out in a rotational path on said surface.

3. The apparatus according to claim 2 wherein said beam converter further comprises at least one reflective element for directing said radiation through said surface radially inwards towards said symmetry axis and said target volume.

4. The apparatus according to claim 2 wherein said radiation has a spectral band between 300nm and 11000nm.

5. The apparatus according to claim 2 wherein said energy fluence of said directed input radiation is less than or equal to said predetermined energy fluence.

6. The apparatus according to claim 2 wherein said radiation at said target volume has an energy fluence less than or equal to said predetermined energy fluence.

7. The apparatus according to claim 2 wherein said rotated radiation is in a collimated form.

8. The apparatus according to claim 2 wherein the distance of said target volume beneath the surface is adjustable.

9. The apparatus according to claim 1 wherein said beam converter comprises a reflective beam divider for spreading said input radiation in said plurality of directions, and a reflective beam collector for redirecting said spread out radiation towards said target volume.

10. The apparatus according to claim 9 wherein said energy fluence of said redirected radiation is less than or equal to said predetermined energy fluence.

11. The apparatus according to claim 9 wherein said radiation has a spectral band between 300nm and 11000nm.

12. Apparatus for delivering radiation beneath a tissue surface, comprising:

a radiation source for inputting a beam of said radiation; and

a beam converter having a symmetry axis, said beam converter adapted to

direct said radiation in a plurality of directions spaced around said symmetry axis such that the majority of said radiation crosses said surface remotely from said symmetry axis, and inclined angularly towards said symmetry axis.

13. Apparatus according to claim 12, wherein said beam converter comprises a rotator having a rotation axis collinear with said symmetry axis for rotating said input radiation around said symmetry axis, such that said radiation is spread out in a rotational path on said surface.

14. Apparatus according to claim 12, wherein said beam converter comprises a reflective beam divider for spreading out said input radiation in said plurality of directions, and a reflective beam collector for redirecting said spread out radiation towards said symmetry axis onto a target volume.

15. A method for delivering radiation beneath a tissue surface, comprising the steps of:

providing a radiation source for inputting a beam of said radiation of predetermined energy fluence; and

converting said input beam into radiation directed in a plurality of directions spaced around a symmetry axis and inclined angularly to said symmetry axis, towards at least one target volume disposed on said symmetry axis beneath said surface, such that:

said radiation has an energy fluence at said surface which is lower on said axis than the maximum energy fluence of said radiation at said surface,

said energy fluence of said radiation at said surface is lower than said predetermined energy fluence of said input beam, and

said energy fluence of said radiation at said at least one target volume is higher than said energy fluence of said radiation at said surface.

16. A method according to claim 15 and further comprising the step of rotating said input radiation around said symmetry axis, such that said radiation is spread out in a rotational path on said surface.

17. A method according to claim 16 and also comprising the step of providing at least one reflective element for directing said radiation through said surface radially inwards towards said symmetry axis and said target volume.

18. A method according to claim 16 and wherein said radiation has a spectral band between 300nm and 11000nm.

19. A method according to claim 16 and wherein said energy fluence of said directed input radiation is less than or equal to said predetermined energy fluence.

20. A method according to claim 16 and wherein said radiation at said target volume has an energy fluence which is less than or equal to said predetermined energy fluence.

21. A method according to claim 16 and wherein said rotated radiation is in a generally collimated form.

22. A method according to claim 16 and wherein the distance of said target volume beneath the surface is adjustable.

23. A method according to claims 15, and further comprising the step of providing a reflective beam divider for spreading said input radiation in said plurality of directions, and a reflective beam

collector for redirecting said spread out radiation towards said target volume.

24. A method according to claim 23 and wherein said energy fluence of said directed input radiation is less than or equal to said predetermined energy fluence.

25. A method according to claim 23 and wherein said radiation has a spectral band between 300nm and 11000nm.